

# CM1263-02SE

## Low Capacitance ESD Protection for High-Speed Serial Interfaces

### Features

- 2 Channels of ESD Protection
- 0.85 pF Loading Capacitance per Channel Typical
- Provides ESD Protection to IEC61000-4-2 Level 4:
  - $\pm 8$  kV Contact Discharge
  - $\pm 15$  kV Air Discharge
- 5-Pin SOT-553 Package
- These Devices are Pb-Free and are RoHS Compliant

### Applications

- LCD and Camera Data Lines in Wireless Handsets that Use High-speed Serial Interfaces such as MDDI, MIPI, MVI and MPL
- I/O Port Protection for Mobile Handsets, Notebook Computers, PDAs, etc.
- Wireless Handsets
- Handheld PCs/PDAs
- LCD and Camera Modules



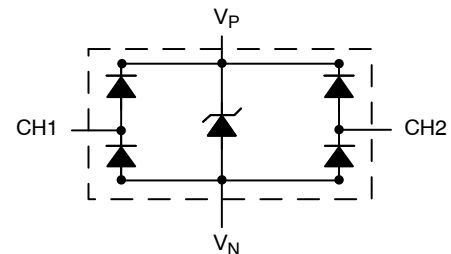
ON Semiconductor®

<http://onsemi.com>



SOT-553  
SE SUFFIX  
CASE 463B

### BLOCK DIAGRAM



### MARKING DIAGRAM



L63 = Specific Device Code  
M = Date Code

### ORDERING INFORMATION

| Device      | Package              | Shipping†        |
|-------------|----------------------|------------------|
| CM1263-02SE | SOT-553<br>(Pb-Free) | 5000/Tape & Reel |

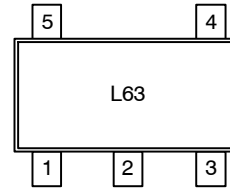
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

# CM1263-02SE

**Table 1. PIN DESCRIPTIONS**

| 5-Pin, SOT-553 Package |                      |
|------------------------|----------------------|
| Pin                    | Description          |
| 1                      | $V_P$                |
| 2                      | $V_N$                |
| 3                      | NC                   |
| 4                      | (CH1) ESD Channel #1 |
| 5                      | (CH2) ESD Channel #2 |

**PACKAGE / PINOUT DIAGRAM**



## SPECIFICATIONS

**Table 2. ABSOLUTE MAXIMUM RATINGS**

| Parameter                                | Rating                         | Units |
|--|--------------------------------|-------|
| Operating Supply Voltage ( $V_P - V_N$ ) | 6.0                            | V     |
| Operating Temperature Range              | -40 to +85                     | °C    |
| Storage Temperature Range                | -65 to +150                    | °C    |
| DC Voltage at any channel input          | $(V_N - 0.5)$ to $(V_P + 0.5)$ | V     |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

# CM1263-02SE

**Table 3. ELECTRICAL OPERATING CHARACTERISTICS** (Note 1)

| Symbol            | Parameter  | Conditions   | Min          | Typ           | Max          | Units |
|-------------------|--|--|--------------|---------------|--------------|-------|
| V <sub>P</sub>    | Operating Supply Voltage (V <sub>P</sub> - V <sub>N</sub> )  |  |              | 3.3           | 5.5          | V     |
| I <sub>P</sub>    | Operating Supply Current   | (V <sub>P</sub> - V <sub>N</sub> ) = 3.3 V   |              |               | 8.0          | μA    |
| V <sub>F</sub>    | Diode Forward Voltage<br>Top Diode<br>Bottom Diode   | I <sub>F</sub> = 8 mA; T <sub>A</sub> = 25°C   | 0.60<br>0.60 | 0.80<br>0.80  | 0.95<br>0.95 | V     |
| I <sub>LEAK</sub> | Channel Leakage Current  | T <sub>A</sub> = 25°C; V <sub>P</sub> = 5 V, V <sub>N</sub> = 0 V,<br>V <sub>TEST</sub> = 0 to 5 V |              | 0.1           | 1.0          | μA    |
| C <sub>IN</sub>   | Channel Input Capacitance  | At 1 MHz, V <sub>P</sub> = 3.3 V, V <sub>N</sub> = 0 V, V <sub>IN</sub> = 1.65 V                   |              | 0.85          | 1.2          | pF    |
| ΔC <sub>IN</sub>  | Channel Input Capacitance Matching   | At 1 MHz, V <sub>P</sub> = 3.3 V, V <sub>N</sub> = 0 V, V <sub>IN</sub> = 1.65 V                   |              | 0.02          |              | pF    |
| V <sub>ESD</sub>  | ESD Protection<br>Peak Discharge Voltage at any<br>channel input, in system:<br>a) Contact Discharge per<br>IEC 61000-4-2 standard<br>b) Air Discharge per<br>IEC 61000-4-2 standard | T <sub>A</sub> = 25°C; (Notes 2 and 3)<br>T <sub>A</sub> = 25°C; (Note 3)                          |              | ±8<br>±15     |              | kV    |
| V <sub>CL</sub>   | Channel Clamp Voltage<br>Positive Transients<br>Negative Transients  | T <sub>A</sub> = 25°C, I <sub>PP</sub> = 1 A, t <sub>P</sub> = 8/20 μS<br>(Note 3)                 |              | +9.96<br>-1.6 |              | V     |
| R <sub>DYN</sub>  | Dynamic Resistance<br>Positive Transients<br>Negative Transients   | I <sub>PP</sub> = 1 A, t <sub>P</sub> = 8/20 μS<br>Any I/O pin to Ground;<br>(Note 3)              |              | 0.96<br>0.5   |              | Ω     |

1. All parameters specified at T<sub>A</sub> = -40°C to +85°C unless otherwise noted.
2. Standard IEC 61000-4-2 with C<sub>Discharge</sub> = 150pF, R<sub>Discharge</sub> = 330 Ω, V<sub>P</sub> = 3.3 V, V<sub>N</sub> grounded.
3. These measurements performed with no external capacitor on V<sub>P</sub> (V<sub>P</sub> floating).

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



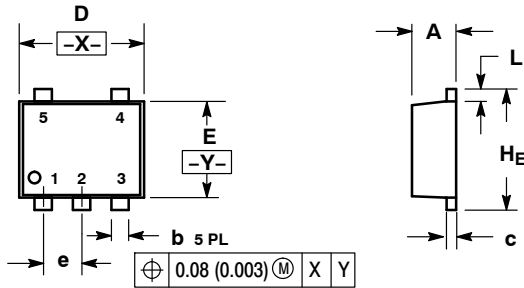
SCALE 4:1

### SOT-553, 5 LEAD

#### CASE 463B

#### ISSUE C

DATE 20 MAR 2013

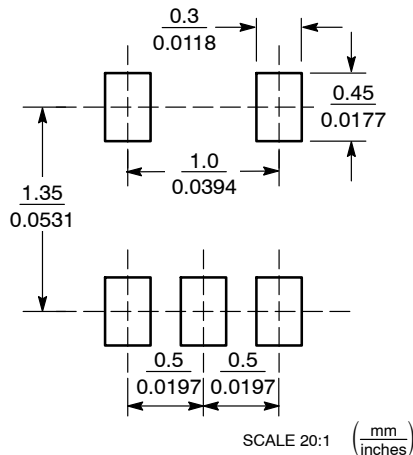


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

| DIM | MILLIMETERS |      |      | INCHES    |       |       |
|-----|-------------|------|------|-----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| A   | 0.50        | 0.55 | 0.60 | 0.020     | 0.022 | 0.024 |
| b   | 0.17        | 0.22 | 0.27 | 0.007     | 0.009 | 0.011 |
| c   | 0.08        | 0.13 | 0.18 | 0.003     | 0.005 | 0.007 |
| D   | 1.55        | 1.60 | 1.65 | 0.061     | 0.063 | 0.065 |
| E   | 1.15        | 1.20 | 1.25 | 0.045     | 0.047 | 0.049 |
| e   | 0.50 BSC    |      |      | 0.020 BSC |       |       |
| L   | 0.10        | 0.20 | 0.30 | 0.004     | 0.008 | 0.012 |
| HE  | 1.55        | 1.60 | 1.65 | 0.061     | 0.063 | 0.065 |

### RECOMMENDED SOLDERING FOOTPRINT\*



### GENERIC MARKING DIAGRAM\*



- XX = Specific Device Code
- M = Date Code
- = Pb-Free Package

(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**STYLE 1:**

- PIN 1. BASE
- 2. EMITTER
- 3. BASE
- 4. COLLECTOR
- 5. COLLECTOR

**STYLE 2:**

- PIN 1. CATHODE
- 2. COMMON ANODE
- 3. CATHODE 2
- 4. CATHODE 3
- 5. CATHODE 4

**STYLE 3:**

- PIN 1. ANODE 1
- 2. N/C
- 3. ANODE 2
- 4. CATHODE 2
- 5. CATHODE 1

**STYLE 4:**

- PIN 1. SOURCE 1
- 2. DRAIN 1/2
- 3. SOURCE 1
- 4. GATE 1
- 5. GATE 2

**STYLE 5:**

- PIN 1. ANODE
- 2. EMITTER
- 3. BASE
- 4. COLLECTOR
- 5. CATHODE

**STYLE 6:**

- PIN 1. EMITTER 2
- 2. BASE 2
- 3. EMITTER 1
- 4. COLLECTOR 1
- 5. COLLECTOR 2/BASE 1

**STYLE 7:**

- PIN 1. BASE
- 2. EMITTER
- 3. BASE
- 4. COLLECTOR
- 5. COLLECTOR

**STYLE 8:**

- PIN 1. CATHODE
- 2. COLLECTOR
- 3. N/C
- 4. BASE
- 5. EMITTER

**STYLE 9:**

- PIN 1. ANODE
- 2. CATHODE
- 3. ANODE
- 4. ANODE
- 5. ANODE

|                         |                                  |  |
|-------------------------|----------------------------------|--|
| <b>DOCUMENT NUMBER:</b> | <b>98AON11127D</b>               | Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| <b>STATUS:</b>          | <b>ON SEMICONDUCTOR STANDARD</b> |  |
| <b>NEW STANDARD:</b>    |                                  |  |
| <b>DESCRIPTION:</b>     | <b>SOT-553, 5 LEAD</b>           | <b>PAGE 1 OF 2</b>   |



ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Email Requests to: [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

ON Semiconductor Website: [www.onsemi.com](http://www.onsemi.com)

### TECHNICAL SUPPORT

North American Technical Support:  
Voice Mail: 1 800-282-9855 Toll Free USA/Canada  
Phone: 011 421 33 790 2910

### Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative